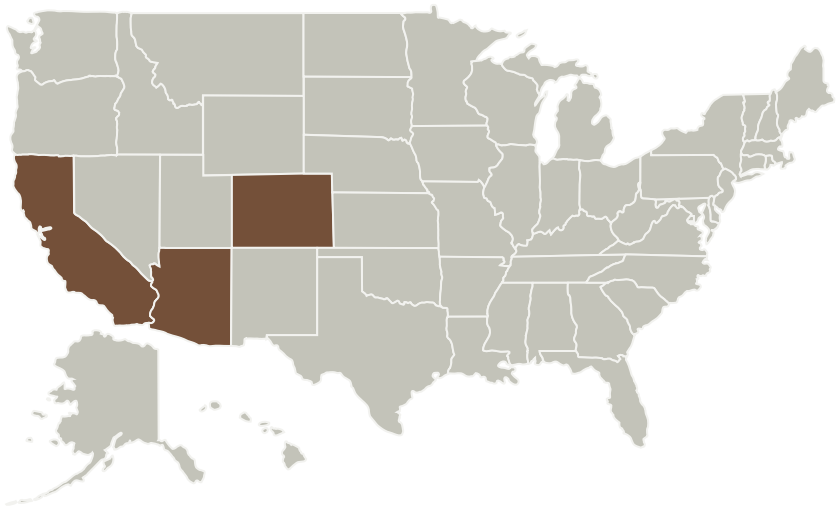
Advancing the TRL of a Compact, High Dynamic Range Ultraviolet Imaging Spectrometer

Completed Technology Project (2017 - 2019)

Project Introduction

The UV spectral range has been specifically identified in the Decadal Survey as it is rich with key information that can be employed to study planetary systems. Ultraviolet spectroscopy has previously enabled studies of emission from atmospheres & exospheres, surface activity, and plasma properties related to bodies ranging from planetesimals to satellites to the major planets. The UV spectral range also provides diagnostics of surface characteristics including mineralogy, frost & condensation, and bulk ices. Because of these reasons, UV spectrometers have been included on most planetary missions dating back to the 1960s. We propose to advance the technology readiness level (TRL) of a compact, modular ultraviolet and visible imaging spectrometer that employs advanced detector, optical coatings, and grating. The instrument will enable the elimination of high voltage power requirements as well as a reduction in mass and volume; it will also exhibit reduced sensitivity to radiation and it will have higher dynamic range and greater overall stability. As part of the proposed effort, we will mature the spectrometer by advancing the delta-doped detector camera subsystem. We will evaluate the performance of the camera in CU-Boulder's testbed. University of Arizona will provide science objectives to help guide development, and will evaluate individual components as well as the full instrument in their testbed.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Maturation of Instruments for Solar System Exploration

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Organizations Performing Work	Role	Type	Location
California Institute of Technology(CalTech)	Supporting Organization	Academia	Pasadena, California

Primary U.S. Work Locations	
Arizona	California
Colorado	

Project Management

Program Director:

Carolyn R Mercer

Program Manager:

Haris Riris

Principal Investigator:

Shouleh Nikzad

Co-Investigators:

Robert A West
Alexander G Carver
Greg Holsclaw
John J Hennessy
Karen R Piggee
Walter M Harris
April D Jewell

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destination

Others Inside the Solar System